

How to calculate bricks in a wall pdf – With Brick Masonry Pier

Estimation is a crucial part of an Engineering. Every civil technician should have a good knowledge of it. The accurate estimation set of procedures is not be followed. Here is the stepwise procedure to calculate the numbers of bricks in the Masonry wall.

You can download a .pdf file for calculation of bricks in the wall just by clicking on the top right corner of this article.

General Procedure for to calculate bricks in a wall



- First of all, calculate the volume of the Masonry. (Volume=length x Breadth x Height)
- Then check for the specification of the brickwork to determine the size of brick and proportion of the mortar and thickness of the mortar joint.
- Calculated the volume of the individual building units. Also, calculate the volume of the building unit with

mortar in it. For instance, if the standard size of brick is 230mmx105mmx55mm and the mortar thickness is 10mm then the volume of the building unit with mortar will be 240mmx115mmx65mm.

- After that calculate numbers of building units with mortar is required.

i.e. Total numbers of building units =
 $(\text{Total volume}(m^3)/(\text{Total volume of a building unit with mortar}(m^3))$

- 5% to 10 % is added as wastage.
- Further to calculate cement and sand required for the masonry can be obtained as,

Volume of Mortar (m^3) =

$\text{Total volume} - (\text{nos of building units} \times \text{Vol. of building units without mortar})$

- Calculate the dry volume of the Mortar by multiplying wet volume and 30-35% of it.
- If the proportion of the mixture is 1:x then,

a. Volume of Cement(m^3) = $\frac{\text{dry volume of mortar}(m^3)}{(1+x)} * 1$

To calculate number of bags, use multiplication factor, 28.8

Note 1 m^3 of cement =28.8 bags of cement each of 50 kgs.

b. Volume of sand (m^3) = $\frac{\text{dry volume of mortar}(m^3)}{(1+x)} * X$

c. Volume of water (lit.)=weight of cement in kgs x (w/c) ratio

Example- 1

Estimate the numbers of bricks required to construct a full brick wall for height 2m and length 9m with 1:6 c/s mortar.

Solution,

Length=9m

Height=2m

Assume,

Size of brick=230mmx105mmx55mm

Mortar thickness=10mm

i) Volume of masonry=9x2x0.23

$$=4.14\text{m}^3$$

ii) Volume of brick=0.23x0.105x0.055

$$=0.001328\text{m}^3$$

iii) Volume of brick with 10 mm mortar= (0.23+0.01) x (0.105+0.01) x (0.055+0.01)

$$=0.001794\text{m}^3$$

iv. **Nos. of bricks required**= $\frac{4.14}{0.001794}$
=2307.692nos

v. **Adding 5% wastage, therefore numbers of brick required=2424 nos.**

$$\text{Nos of bricks required per m}^3 = \frac{2424}{4.14}$$

$$=585 \text{ nos.}$$

vi. **Volume of mortar=4.14-(2307.692*0.001328)**
=1.075m³

vii. **Dry Volume of mortar=1.35*1.075**
=1.4505m³

$$\begin{aligned} \text{viii. Volume of Cement} &= \frac{1.4505}{(1+6)} * 1 \\ &= 0.2072 \text{m}^3 \\ &= 5.96 \text{ bags } (0.2072 * 28.8) \end{aligned}$$

$$\begin{aligned} \text{Volume of Sand} &= \frac{1.4505}{(1+6)} * 6 \\ &= 1.243 \text{m}^3 \end{aligned}$$

$$\text{Volume of Cement / m}^3 = 1.44 \text{ bags}$$

$$\text{Volume of Sand / m}^3 = 0.3 \text{ m}^3$$

Example -2, Half brick wall

Estimate the numbers of bricks required to construct a half brick wall for height 6ft and length 15ft with 1:4 c/s mortar.



Solution,

$$\text{Length} = 15 \text{ft} = 4.62 \text{m}$$

$$\text{Height} = 6 \text{ft} = 1.83 \text{m}$$

Assume,

$$\text{Size of brick} = 230 \text{mm} \times 105 \text{mm} \times 55 \text{mm}$$

$$\text{Mortar thickness} = 10 \text{mm}$$

$$\text{i) Volume of masonry} = 4.62 \times 1.83 \times 0.105$$

$$=0.887\text{m}^3$$

ii) Volume of brick = $0.23 \times 0.105 \times 0.055$

$$= 0.001328 \text{ m}^3$$

Volume of brick with 10mm mortar = $(0.23+0.01) \times (0.105+0.01) \times (0.055+0.01)$
 $=0.001794\text{m}^3$

iii. Nos. of bricks required = $\frac{0.887}{0.001794}$
 $= 494.42\text{nos}$

iv. Adding 5% wastage, therefore numbers of brick required = 519.147 nos.

$$\text{Nos of bricks required per m}^3 = \frac{519.147}{0.887}$$
$$= 585 \text{ nos.}$$

v. Volume of mortar = $0.887 - (494.42 \times 0.001328)$

$$= 0.230\text{m}^3$$

vi. Dry Volume of mortar = 1.35×1.075
 $= 0.311\text{m}^3$

vii. Volume of Cement = $\frac{0.311}{(1+4)} \times 1$
 $= 0.062\text{m}^3$
 $= 1.7856 \text{ bags } (0.2072 \times 28.8)$

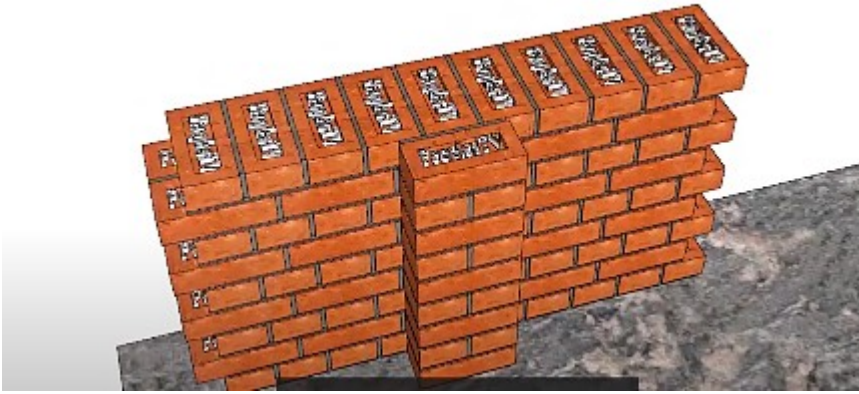
Volume of Sand = $\frac{0.2304}{(1+4)} \times 4$
 $= 0.184\text{m}^3$

Volume of Cement / $\text{m}^3 = 2.0 \text{ bags}$

Volume of Sand / $\text{m}^3 = 0.207 \text{ m}^3$

Example 3, With Full Brick wall and Pier

Estimate the numbers of bricks required to construct a full brick wall for height 3m and length 10m and 1 x 1/2 brick masonry pier at 2m c/c with 1:6 c/s mortar.



Solution,

Length=10m

Height=3m

Size of pier= $(230+105+10)$ mm \times $(230+105+10)$ mm
 $=0.345 \times 0.345$ m

Assume,

Size of brick=230mm \times 105mm \times 55mm

i) Volume of masonry= $((10 - (0.345 \times 6)) \times 3 \times 0.23) + (6 \times 0.345 \times 0.345)$
 $=6.185 \text{ m}^3$ (since there are 6 nos of piers)

ii) Volume of brick= $0.23 \times 0.105 \times 0.055$
 $=0.001328 \text{ m}^3$

Volume of brick with 10mm mortar= $(0.23+0.01) \times (0.105+0.01) \times (0.055+0.01)$
 $=0.001794 \text{ m}^3$

$$\text{iii. Nos. of bricks required} = \frac{6.185}{0.001794} \\ = 3448.077 \text{ nos}$$

$$\text{iv. Adding 5\% wastage, therefore numbers of brick required} = 3620.48 \text{ nos.} \\ \text{Nos of bricks required per m}^3 = \frac{3620.48}{6.185}$$

$$= 585.36 \text{ nos.}$$

$$\text{v. Volume of mortar} = 6.185 - (3448.077 * 0.001328) \\ = 1.605 \text{ m}^3$$

$$\text{vi. Dry Volume of mortar} = 1.35 * 1.235 \\ = 2.168 \text{ m}^3$$

$$\text{vii. Volume of Cement} = \frac{2.168}{(1+6)} * 1 \\ = 0.31 \text{ m}^3 \\ = 8.928 \text{ bags } (0.31 * 28.8)$$

$$\text{Volume of Sand} = \frac{2.168}{(1+6)} * 6 \\ = 1.858 \text{ m}^3$$

Volume of water when w/c ratio=0.5

$$= 0.5 * 8.928 * 50 \text{ (1 bag=50kgs)}$$

$$= 223.2 \text{ lts}$$

$$\text{Volume of Cement / m}^3 = 1.44 \text{ bags}$$

$$\text{Volume of Sand / m}^3 = 0.3 \text{ m}^3$$

Example 4, Full brick masonry wall with Pier

Estimate the numbers of bricks required to construct a full brick wall for height 3ft and length 8 ft and 1 brick masonry pier at 4 ft c/c with 1:4 c/s mortar.

Solution,

$$\text{Length} = 8 \text{ ft} = 2.44,$$

Breadth=3ft=0.91m

Size of pier=0.23×0.23m

Assume,

Size of brick=230mm×105mm×55mm

Thickness of mortar =10 mm

$$\begin{aligned} \text{i) Volume of masonry} &= (2.44 - (3 \times 0.23)) \times 0.91 \times 0.105 + 3(0.23 \times 0.23 \times 0.91) \\ &= 0.311 \text{m}^3 \end{aligned}$$

$$\text{ii) Volume of brick} = 0.23 \times 0.105 \times 0.055$$

$$= 0.001328 \text{ m}^3$$

$$\begin{aligned} \text{iii) Volume of brick with 10 mm mortar} &= (0.23 + 0.01) \times (0.105 + 0.01) \times (0.055 + 0.01) \\ &= 0.001794 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} \text{iv. Nos. of bricks required} &= \frac{0.311}{0.001794} \\ &= 173.35 \text{ nos} \end{aligned}$$

$$\begin{aligned} \text{v. Adding 5\% wastage, therefore numbers of brick required} &= 182.02 \text{ nos.} \\ \text{Nos. of bricks required per m}^3 &= 585.28 \text{ nos.} \end{aligned}$$

$$\begin{aligned} \text{vi. Volume of mortar} &= 0.311 - (173.71 \times 0.001328) \\ &= 0.080 \text{m}^3 \end{aligned}$$

$$\begin{aligned} \text{vii. Dry Volume of mortar} &= 1.35 \times 0.080 \\ &= 0.108 \text{m}^3 \end{aligned}$$

$$\begin{aligned} \text{viii. Volume of Cement} &= \frac{0.108}{(1+4)} \times 1 \\ &= 0.02168 \text{m}^3 \\ &= 0.62 \text{ bags } (0.2072 \times 28.8) \end{aligned}$$

$$\begin{aligned} \text{Volume of Sand} &= \frac{0.108}{(1+4)} \times 4 \\ &= 0.0864 \text{m}^3 \end{aligned}$$

Volume of water when w/c ratio=0.45

$$=0.45 \times 0.62 \times 50 \text{ (1 bag=50kgs)}$$

$$=13.95\text{lbs}$$

$$\text{Volume of Cement / m}^3 = 1.99 \text{ bags}$$

$$\text{Volume of Sand / m}^3 = 0.2 \text{ m}^3$$

Summary

Item	Quantity
Brick Work / m ³	585 nos of size 230*105*55mm
Cement in 1:4 mortar/ m ³	2 bags
Cement in 1:6 mortar/ m ³	1.44 bags
Sand in 1:4 mortar/ m ³	0.2cumec
Sand in 1:6 mortar/ m ³	0.3cumec

I hope this article on “How to calculate bricks in a wall pdf – With Brick Masonry Pier” remains helpful for you.

Happy Learning – Civil Concept

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